Cellulose Nanomaterials—Solutions for Industry Applications

2018 International Conference on Nanotechnology for Renewable Materials

11-14 June 2018
Monona Terrace Community
and Convention Center
Madison, WI, USA

conference.tappinano.org

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Are you a student or young professional working with cellulosic or other renewable nanomaterials?

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Help build TAPPI Nano’s Global Network for Students and Young Professionals

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Join the TAPPI Nano Division Student Committee and:

- Connect with students and young professionals around the world
- Share knowledge and ideas to make an impact
- Produce student-led webinars, newsletters, forums and surveys that engage students
- Learn how to transition from academia to industry
- Design and shape events for students at TAPPI’s annual Nano conference
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Dear Colleagues,

It is a pleasure to welcome you to the 2018 International Conference on Nanotechnology for Renewable Materials at the historic Monona Terrace Community and Convention Center in Madison, Wisconsin.

Frank Lloyd Wright, who grew up in Madison, envisioned a curvilinear gathering place that would link the shore of Lake Monona to the State Capitol. Initially proposing the Monona Terrace Community and Convention Center design in 1938, it would take 59 years for his architectural vision to become reality. With interiors redesigned by Taliesin architect Tony Puttnam, Monona Terrace spans ninety feet out over shimmering waters, incorporating thoroughly modern technology and amenities with the architect’s signature organic design. A perfect setting for this year’s conference.

Thank you for joining us for a robust conference program designed to advance research, development and deployment of renewable nanomaterials. Presenting over 160 technical presentations, an End Users Panel, two workshops, and two keynote presentations, we hope you leave fully informed on the current state of renewable nanomaterials commercial production. Numerous networking opportunities are scheduled throughout the four days, including the Conference Dinner and Awards Ceremony at the historic Orpheum Theater, Young Professionals Mixer, Poster Session and Student Competition, exhibitor displays and more.

Co-located with the Forest Products Society’s 72nd International Convention (IC), introduces the opportunity to learn more about the sustainable use of wood and renewable cellulosic materials through conference sessions, a short Wood Science course, and a tour of the USDA Forest Service, Forest Products Laboratory.

To maximize your time, utilize this conference guide as well as the mobile app to see the session schedule, view times and locations, and plan your day.

Most importantly, we’d like to thank the research committee, its subcommittees, session chairs, speakers and our sponsors and exhibitors. This conference would not have been possible without your tremendous support and dedication.

We hope you enjoy the conference!

2018 Conference Chairs:
Alan Rudie, USDA Forest Products Laboratory
Satoshi Hirata, National Institute of Advanced Industrial Science and Technology
Maria Soledad Peresin, Auburn University

Technical Program Chair:
Joel Kelly, BC Research Inc.

Technical Program Vice-Chair:
Michael Reid, McMaster University
Conference Highlights

Tour - USDA Forest Service, Forest Products Laboratory
Monday, 11 June, 2018 • 9:00am - 10:30am & 1:30pm - 3:00pm
(Separate Registration Required. $20)
Tour attendees will go on a 1.5 hour tour and see a pilot-scale cellulose nanomaterial production facility, an engineering mechanics lab where we can test single fibers to full-scale wood structures, a composites processing facility, an environmental chamber to measure moisture movement through full-scale wall assemblies, and the largest (over 103,000 samples) and best research wood collection in the world.

Buses will pick up outside of the Convention Center at 8:30am (for the 9:00am tour) and 1:00pm (for the 1:30pm tour).

Student Committee Lunch – Meet your Mentor/Mentee
Monday, 11 June, 2018 • 12:00pm – 1:30pm
Hosted by the Nano Division’s Student Committee
(Pre-registration is Required.)

This program is designed to help students, postdocs and young professionals make the most of their conference experience by pairing them with global leaders in renewable materials. This is a fun, informal opportunity for student and young professionals to meet, connect and make an impact. Experts will be paired with young professionals to mentor them during the conference.

Practical Safety Strategies for Bio/Nano Technology Commercialization Workshop
Monday, 11 June, 2018 • 9:00am – 12:00pm
(Separate Registration Required. Member: $160; Nonmember: $220)

Lead Instructor: Jo Anne Shatkin, Vireo Advisors, LLC.
This half day workshop will build on last year’s introductory Health Safety and Environmental Considerations for Bio/Nano Technology Commercialization, by focusing on the demonstration of occupational, environmental, and consumer health and safety for new technologies, with special consideration of bio-based and nanoscale materials. Interactive presentations will explore these issues from the perspectives of data development, risk assessment and management strategies, regulatory requirements, and safety demonstration. The team from Vireo Advisors, an international advising firm dedicated to advancing the commercialization of safer and environmentally preferable technologies, will lead presentations, demonstrations, case studies, and discussions.

NEW Cellulose Nanomaterials Characterization Workshop – Primary Characterization
Monday, 11 June 2018 • 1:00pm - 3:30pm
(Separate Registration Required. Member: $160; Nonmember: $220)

Workshop Organizers:
Johan Foster, Virginia Tech
Robert Moon, USDA Forest Service

For the advancement in understanding process optimization, and utilization of cellulose nanomaterials (CNMs) it is critical to use characterization measurement protocols that give consistent, reliable and accurate results. However, because of the exponential growth in interest/activity in CNMs, much of the development of these measurement protocols have been outpaced. With this in mind, this half-day workshop summaries/outlines details the best practices and limitations for several techniques/methods typically used for the characterization of CNMs, in particular, surface charge, purity, crystallinity, particle morphology, and mechanical properties. Each topic will be covered by experts in the field for the given technique, with the purpose to inform the audience why one should consider using a given technique (e.g., use “this” technique for “that” reason”), then provide a detailed best practice for the technique (e.g., “here is the proper way to do “this” technique). Where possible examples have been given to highlight how “this” technique shows “these” data on “these” CNMs. Throughout the workshop, specific comments are made regarding any differentiation in the characterization of CNC versus CNF.

Young Professionals Mixer
Monday, 11 June 2018 • 6:30pm – 7:30pm
Hosted by the Young Professionals Division

This event, hosted by TAPPI’s Young Professionals Division, is a great opportunity to network with a diverse group of young professionals in a relaxed environment while attending the 2018 TAPPI Nano Conference. This event offers a great way to combine both business and social networking. Enjoy drinks and appetizers with other YP’s as well as division representatives. This event is geared toward those who are 35 and under but is open to all conference attendees.
Lunch Presentation  
Tuesday, 12 June, 2018 • 12:00pm – 2:00pm

Sponsored by: [CelluForce]

Yinyong Li, Treat LLC  
FogKicker from Nanocellulose: A Journey from Lab to Market

End Users Panel  
Hosted by the End Users Committee  
Tuesday, 12 June, 2018 • 4:00pm – 5:30pm  
Moderator: Hamdy Khalil, The Woodbridge Group  
End User Panelists:  
Kent Nielsen, 3M  
Toivo Kodas, Cabot  
Alper Kiziltas, Ford Motor Company  
Raj Wallajpet, Kimberly Clark

This session is expected to be of wide interest to scientists and producers alike. Learn about the requirements and issues that the ultimate end user will have when producing commercial products incorporating cellulose nanomaterials.

Poster Session and Student Poster Competition (Joint Session with FPS)  
Coordinated by the Student Committee  
Tuesday, 12 June 2018 • 5:30pm – 7:30pm

Visit more than 50 presentations which focus on additional application characterization and functionalization of cellulose and other renewable nanomaterials. The poster session and student poster competition is held every year at the conference to showcase undergraduate and graduate research. Conference attendees are invited to vote on the student posters in the competition using either paper ballot or the voting tool in the Conference App. Prizes are award to the top poster presenters.

Research Committee Meeting  
(Invitation Only)  
Wednesday, 13 June, 2018 • 7:30am – 8:30am

Lunch Presentation  
Wednesday, 13 June, 2018 • 12:00pm – 2:00pm

Sponsored by: [Nanocellulose Forum]

Akira Isogai, University of Tokyo  
Present Situation and Future Prospects of Nanocellulose R&D in Japan

Conference Dinner and Awards Ceremony at the Orpheum Theater  
Wednesday, 13 June, 2018 • 6:00pm – 10:00pm  
(Separate registration and fee required = $100. Guest tickets are available = $175)

Join us at the historic Orpheum Theater for our awards ceremony, dinner and entertainment. The Orpheum Theater was built in 1926 and has had limited changes to its structure over the years. It is listed on the National register of Historic Places in Wisconsin. Dinner will be followed by our awards ceremony. The evening will conclude with entertainment provided by Piano Fondue, a high energy dueling piano show with an interactive all request, comedy aspect.

Schedule:  
6:00pm – Bus picks up at the Monona Terrace Convention Center  
6:15pm – 7:00pm • Cocktails  
7:00pm – 8:00pm • Dinner & Awards Ceremony  
8:00pm – 10:00pm • Piano Fondue  
10:15pm • Bus returns to hotel

Career Roundtable  
Thursday, 14 June, 2018 • 2:00pm – 3:30pm

The platform will be comprised of six representatives from academia, government and industry with a member of the student committee as moderator.

The first 30 minutes will be a presentation from one of the panelist with the second 30 minutes Q&A and the final 30 minutes where students and young professionals can directly engage with panelist from their job sectors. Panelist:

Feng Jiang, University of British Columbia  
Shaul Lapidot, Meloda  
Kim Nelson, American Process  
Jo Anne Shatkin, Vireo Advisors, LLC  
John Simonsen, Oregon State University  
J.Y. Zhu, USDA Forest Products Laboratory

Producers Committee Meeting  
(Invitation Only)  
Friday, 15 June, 2018 • 9:00am – 12:00pm

2019 Nano Conference Planning Meeting  
(Invitation Only)  
Friday, 15 June, 2018 • 1:00pm – 3:00pm
Keynote Speakers

Monday, 11 June, 2018
4:00pm – 5:30pm

Alper Kiziltas
Research Scientist,
Ford Motor Company

Driving the Automotive Industry Using Sustainable Materials

About the Speaker:
Alper Kiziltas is a Research Scientist with the Sustainable Biomaterials and Plastic Research group at Ford Motor Co. where his particular interests lie in sustainable materials such as bio-based and recycled resins, natural fiber composites, and nanofillers-reinforced foams and composites.

He is a graduate of the University of Maine where he received his Master’s and Ph.D. degrees from the School of Forest Resources. He has published over 50 papers and presentations in peer-reviewed journals and conferences, and holds five patent disclosures.

For more information on Dr. Kiziltas and Ford’s nanocellulose program, please be sure to read the interview conducted by Paper3600 editor Jan Bottiglieri. The wide-ranging discussion was first published in the May/June 2018 edition of the magazine. In case you missed it, a copy can be found in your Nano 2018 Conference bag.

Thursday, 14 June 2018
12:00pm – 2:00pm

Michael Goergen
Vice President for Innovation and Director, P³Nano at U.S. Endowment for Forestry and Communities

Beyond Nano: Why Tiny Bits of Trees Make a Big Difference for Forests

About the Speaker:
Michael Goergen joined the U.S. Endowment for Forestry and Communities (Endowment) in September of 2013 to lead efforts focused on innovation in the forest sector. He is focused on taking cellulosic nanotechnology from the lab to commercialization, and is bringing together partners in the public and private sectors to accelerate the development of innovative uses of renewable materials from forests.

He graduated from the SUNY College of Environmental Science and Forestry where he received a Bachelor of Science degree in Environmental Policy and Management and a Master of Science degree in Forest Resource Policy and Management.

Michael is a recipient of the National Association of State Foresters Award for Outstanding Service in Forest Public Policy, the Society of American Foresters’ Young Forester Leadership Award, the SAF President’s Leadership Award, and Travel Portland’s Twin Spires Award.
## Schedule At-A-Glance (Sunday through Tuesday)

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### Schedule At-A-Glance (Wednesday through Friday)

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<th>Wednesday, 13 June</th>
<th>Thursday, 14 June</th>
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| 8:00am - 8:30am | Technical Sessions  
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EH, FI, GJ | Plenary  
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| 8:30am - 9:00am | Plenary  
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| 9:00am - 9:30am | Technical Sessions  
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| 3:00pm - 3:30pm |  
| 3:30pm - 4:00pm | Break  
Grand Terrace | Break  
Grand Terrace |  
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| 4:00pm - 4:30pm | Technical Sessions  
Hall of Ideas  
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Lecture Hall  
Room MNQR  
Room KLOP |  
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| 4:30pm - 5:00pm | Technical Sessions  
Hall of Ideas  
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| 5:00pm - 5:30pm |  
| 5:30pm - 6:00pm |  
| 6:00pm - 6:30pm |  
| 6:30pm - 10:00pm | Conference Dinner &  
Awards Ceremony  
Orpheum Theater | Paul Bunyan  
Community Terrace |  

* invitation only

**Conference Dinner & Awards Ceremony**  
Orpheum Theater

**President’s Reception (Invite Only)**  
Hall of Fame Room

**2018 Nano Conference Wrap up Meeting**  
Hall of Ideas  
EH

**2019 Nano Conference Planning Meeting**  
Hilton Monona Terrace  
Room: LaFollette

**Tour to Talesin**
## Technical Program

As of 5/21/18 - Subject to change – please check the conference website for updates.

<table>
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<tr>
<th>Time</th>
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<tr>
<td>9:00am-10:30am</td>
<td>Forest Products Laboratory Tour #1</td>
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</table>
| 9:00am-12:00pm| Practical Safety Strategies for Bio/Nano Technology Commercialization Workshop  
Room: Hall of Ideas F |
| 12:00pm-1:30pm| Student Committee Lunch  
Room: Hall of Ideas G |
| 1:00pm – 4:00pm| Cellulose Nanomaterials Characterization Workshop – Primary Characterization  
Room: Hall of Ideas F |
| 2:00pm–3:30pm | Forest Products Laboratory Tour #2          |
| 4:00pm-5:30pm | Session 1: OPENING SESSION AND KEYNOTE-Driving the Automotive Industry Using Sustainable Materials  
Alper Kiziltas, Ford Motor Company  
Room: Ballroom ABCD |
| 5:30pm-7:00pm | Welcome Reception  
Room: Grand Terrace |
| 6:30pm-7:30pm | Young Professionals Mixer  
Room: Capitol Club @ Hilton Monona Terrace |

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<th>Time</th>
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| 8:30am – 10:00am| Session 2: Particle Size Measurement  
Session Chair: Paul Russo, Georgia Tech  
Room: Hall of Ideas EH |
| 8:32           | Proof-of-Concept of Gel Fractionation of Bleached Eucalyptus Kraft MFC  
Braz Demuner, Fibria Celulose SA |
| 8:54           | Determining Nanocellulose Particle Size - A Comparative Study  
Valdeir Arantes, Lorena School of Engineering, University of São Paulo |
| 9:16           | Characterization of Concentrated Aqueous CNC Suspensions by Static Multiple Light Scattering: Equivalent Particle Size and Suspension Stability  
Zygmunt Jakubek, National Research Council of Canada |
| 9:38           | Investigations into Low Level Qualification Techniques for CNC  
Brian O’Connor, FPInnovations |
| 10:00am-10:30am| Break |

- **Session 3:** Nanolignin and Ligno-Nanocellulose: Production and Application Prospects  
Session Chair: Nathalie Lavoine, North Carolina State University  
Room: Hall of Ideas FI
- **Session 4:** Responsive & Functional Materials I  
Session Chair: Emily Cranston, McMaster University  
Room: Hall of Ideas GJ

- Bio-nanomaterials Development: Linking R&D Activities and Industrialization of Lignin Micro - and Nanoparticles  
Orlando Rojas, Aalto University
- Cellulose Nanomaterial in High Performance Water-based Drilling Fluid  
Qinglin Wu, Louisiana State University
- Encapsulation of Phase Change Materials in Cellulose Nanocrystals-Reinforced Polyurethane Microcapsules and Their Incorporation in Asphalt for Snow and Ice Melting  
Carlos Martinez, Purdue University
- Sensing Water Diffusion and its Effects in CNC-Epoxy Composites Using Aquafluor  
Jeremiah Woodcock, National Institute of Standards and Technology
- Unusual Approaches to Cellulose Nanocrystal Modification: Allomorph Transition and End-to-End Connections  
Eero Kontturi, Aalto University
# Technical Program

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<table>
<thead>
<tr>
<th>Time</th>
<th>Tuesday, 12 June (continued)</th>
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</thead>
<tbody>
<tr>
<td><strong>10:30am - 12:00pm</strong></td>
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<tr>
<td><strong>10:32</strong></td>
<td>Session 5: 3D Printing &amp; Coatings</td>
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<tr>
<td></td>
<td>Session Chair: Stephanie Beck, FPInnovations</td>
</tr>
<tr>
<td></td>
<td>Room: Hall of Ideas EH</td>
</tr>
<tr>
<td><strong>10:54</strong></td>
<td>Session 6: Industrial Applications</td>
</tr>
<tr>
<td></td>
<td>Session Chair: Gordon Giles, Alberta Innovates</td>
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<tr>
<td></td>
<td>Room: Hall of Ideas FH</td>
</tr>
<tr>
<td><strong>11:16</strong></td>
<td>Session 7: Foams &amp; Gels I</td>
</tr>
<tr>
<td></td>
<td>Session Chair: Marc A. Dubé, University of Ottawa</td>
</tr>
<tr>
<td></td>
<td>Room: Hall of Ideas GJ</td>
</tr>
<tr>
<td><strong>10:32</strong></td>
<td>Interaction in Cellulosic Fiber-Fiber Joints at Humid and Wet Conditions by AFM and Confocal Raman Microscopy</td>
</tr>
<tr>
<td></td>
<td>Agne Swerin, RISE Research Institutes of Sweden</td>
</tr>
<tr>
<td><strong>10:54</strong></td>
<td>Towards Enhanced Durability and Sustainable Construction through Tuned Cellulose Nanofibres</td>
</tr>
<tr>
<td></td>
<td>Vivek Bindiganavile, University of Alberta</td>
</tr>
<tr>
<td><strong>11:16</strong></td>
<td>Towards Nanoenabled Bio-Based Future Solutions by Foam Technologies</td>
</tr>
<tr>
<td></td>
<td>Katarina Torvinen, VTT Technical Research Centre of Finland Ltd.</td>
</tr>
<tr>
<td><strong>10:54</strong></td>
<td>Cellulose Filament Reinforcement Cement Board</td>
</tr>
<tr>
<td></td>
<td>Xiaolin Cai, FPInnovations</td>
</tr>
<tr>
<td><strong>11:16</strong></td>
<td>Ultralight Weight Kapok Fiber Derived Aerogels for Oil Spill Cleaning</td>
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<tr>
<td></td>
<td>Indu Chauhan, Indian Institute of Technology Delhi</td>
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<thead>
<tr>
<th>Time</th>
<th>Tuesday, 12 June (continued)</th>
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<tbody>
<tr>
<td><strong>12:00pm - 2:00pm</strong></td>
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<tr>
<td><strong>12:00pm - 2:00pm</strong></td>
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<tr>
<td><strong>2:00pm - 3:30pm</strong></td>
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</tr>
<tr>
<td><strong>2:02</strong></td>
<td>Session 8: Lunch with Presentation Sponsored by Celluflorce Inc.</td>
</tr>
<tr>
<td></td>
<td>FogKicker from Nanocellulose: A Journey from Lab to Market</td>
</tr>
<tr>
<td></td>
<td>Speaker: Yinyong Li, Treaty, LLC.</td>
</tr>
<tr>
<td></td>
<td>Room: Ballroom CD</td>
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<tr>
<td><strong>2:02</strong></td>
<td>Use of Membrane to Recover Sulfuric Acid</td>
</tr>
<tr>
<td></td>
<td>Emily Sharata, Membrane Specialists</td>
</tr>
<tr>
<td><strong>2:24</strong></td>
<td>CNC Production at Dramatically Lower Acid Ratios</td>
</tr>
<tr>
<td></td>
<td>Joel Kelly, NORAM / BC Research</td>
</tr>
<tr>
<td><strong>2:24</strong></td>
<td>Nanocellulose Functionalization Using Silsesquioxane Particles Sol Gel Formation in Aqueous Conditions and their Application for Superhydrophobic Coated Paper</td>
</tr>
<tr>
<td></td>
<td>Julien Bras, Univ. Grenoble Alpes, Grenoble INP, LGP2</td>
</tr>
<tr>
<td><strong>2:46</strong></td>
<td>Mechanically Adaptive Bio-Nanocomposites for Implantable Sensing</td>
</tr>
<tr>
<td></td>
<td>Johan Foster, Virginia Tech</td>
</tr>
<tr>
<td><strong>2:46</strong></td>
<td>Cellulose Nano Crystals Production and Development of Innovative Products</td>
</tr>
<tr>
<td></td>
<td>Shaul Lapidot, Melodea, Ltd.</td>
</tr>
<tr>
<td><strong>3:08</strong></td>
<td>Cost Effective Production of CNC at InnoTech Alberta, Behzad Alvaz, InnoTech Alberta, Inc.</td>
</tr>
<tr>
<td><strong>3:08</strong></td>
<td>Study of Structure Dependence of Barrier Properties in Nanofibrillated Cellulose Films for Intelligent Food Packaging Applications</td>
</tr>
<tr>
<td></td>
<td>Vadim Kisilitsin, University of Alberta</td>
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<tr>
<td><strong>3:30pm - 4:00pm</strong></td>
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**BREAK**
# Technical Program

As of 5/21/18 - Subject to change – please check the conference website for updates.

## Tuesday, 12 June (continued)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 12 End User Panel</th>
<th>Session 13: Tissue Engineering, Implants and Drug Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00pm-5:30pm</td>
<td>Moderator: <strong>Hamdy Khalil</strong>, Woodbridge Foam Corporation</td>
<td>Session Chair: <strong>Johan Foster</strong>, Virginia Tech</td>
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<td>Room: Hall of Ideas FGJ</td>
<td>Room: Hall of Ideas EH</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Session 13: Tissue Engineering, Implants and Drug Delivery</th>
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</thead>
<tbody>
<tr>
<td>4:02</td>
<td><strong>Dr. Alper Kizitas</strong>, Ford Motor Company</td>
</tr>
<tr>
<td></td>
<td>Shape-Memory 3D Printable Hydrogels with Anti-Microbial Properties</td>
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<td></td>
<td><strong>Gilberto Siqueira</strong>, Applied Wood Materials Lab. - Empa</td>
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<thead>
<tr>
<th>Time</th>
<th>Session 13: Tissue Engineering, Implants and Drug Delivery</th>
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<tbody>
<tr>
<td>4:22</td>
<td><strong>Dr. Toivo Kodas</strong>, Cabot Corporation</td>
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<tr>
<td></td>
<td>Cellulose-Based Lateral Flow Devices for Low-Cost Point-of-Care Blood Coagulation Monitoring</td>
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<td><strong>Hua Li</strong>, University of Cincinnati</td>
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<tr>
<td>4:46</td>
<td><strong>Dr. Kent Nielsen</strong>, 3M</td>
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<tr>
<td></td>
<td>Evaluating Mucoadhesion Properties of Nanocellulose in Gastrointestinal Tract</td>
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<td><strong>Yu-Ju Lin</strong>, University of Georgia</td>
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<tbody>
<tr>
<td>5:02</td>
<td><strong>Dr. Raj Wallajpet</strong>, Kimberly Clark Corporation</td>
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<tr>
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<td>Vitamin B Complex Encapsulated on Bacterial Nanocellulose</td>
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<td><strong>Diego Gómez-Maldonado</strong>, Auburn University</td>
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<tr>
<th>Time</th>
<th>Session 14: Poster Session and Student Poster Competition</th>
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<tbody>
<tr>
<td>5:30pm-7:30pm</td>
<td>Room: Ballroom A/Grand Terrace</td>
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## Wednesday, 13 June

<table>
<thead>
<tr>
<th>Time</th>
<th>Research Committee Meeting (Invitation Only)</th>
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<tbody>
<tr>
<td>7:30am–8:30am</td>
<td>Room: Doty @ Hilton Monona Terrace</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Session 15: Automotive &amp; Other Manufacturing Processing</th>
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<tbody>
<tr>
<td>8:30am-10:00am</td>
<td>Session Chair: <strong>Keith Gourlay</strong>, Performance BioFilaments</td>
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<td>Room: Hall of Ideas EH</td>
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<tbody>
<tr>
<td>8:32</td>
<td><strong>Ejaz S. Haque</strong>, Georgia Institute of Technology</td>
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<tr>
<td></td>
<td>Chitin and Cellulose Spray Coated Nanomaterials for Sustainable Barrier Applications</td>
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<td><strong>Chinmay Satam</strong>, Georgia Institute of Technology</td>
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<tr>
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<tbody>
<tr>
<td>8:54</td>
<td><strong>Fabiola Vilaseca</strong>, University of Girona</td>
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<td></td>
<td>High Performance Nanocellulose – Polymides Composites</td>
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<tbody>
<tr>
<td>9:16</td>
<td><strong>Hiroyuki Yano</strong>, Kyoto University</td>
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<tr>
<td></td>
<td>Toward the Applications of CNFs Materials for Automotive Parts</td>
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<tbody>
<tr>
<td>9:38</td>
<td><strong>Craig Clemons</strong>, USDA Forest Products Laboratory</td>
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<td>Towards CNC-Enabled Lightweighting of Automotive Components</td>
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<tbody>
<tr>
<td>10:00am-10:30am</td>
<td><strong>Doug Bousfield</strong>, University of Maine</td>
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## Session 15: Automotive & Other Manufacturing Processing

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<tr>
<td>10:00am-10:30am</td>
<td><strong>Rajesh Koppolu</strong>, Åbo Akademi University</td>
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<tr>
<td></td>
<td>Development of Cellulose Fibre Yarns for Hormone Capture From Aqueous Matrices</td>
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<td><strong>Hannes Orelma</strong>, VTT Technical Research Centre of Finland</td>
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<td>10:00am-10:30am</td>
<td><strong>Nikolay Semenikhin</strong>, Georgia Institute of Technology</td>
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<td>Novel Tunable Amphiphilic to Hydrophobic Nanocelluloses Via a Multi-Functional Reagent</td>
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<td><strong>You-Lo Hsieh</strong>, University of California, Davis</td>
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<th>Time</th>
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</thead>
</table>
| 10:30am-12:00pm | **Session 18: Melt & Dry Processing I**  
Session Chair: Behzad Ahvazi, Innotech Alberta  
Room: Hall of Ideas EH  
**Session 19: Self-and Directed Assembly of Nanocellulose**  
Session Chair: Agne Swerin, RISE Research Institutes of Sweden  
Room: Hall of Ideas F1  
**Session 20: Foams & Gels II**  
Session Chair: Eero Konturri, Aalto University  
Room: Hall of Ideas GJ                                                                 |
| 10:32         | Tiffany Abitbol — Thermoplastic Composites via Melt-Blending  
*Douglas Fox, American University*  
Cellulose Nanocrystal — Thermoplastic Composites via Melt-Blending  
*Douglas Fox, American University*  
Confinement Driven Organization of CNF and CNC  
*Gustav Nyström, Empa*  
Fabrication of Cellulose and Whole Biomass Aerogels Directly from Ground Douglas Fir Using a Molten Salt Hydrate as Solvent  
*Yang Liao, University of Wisconsin-Madison*  
**Session 19: Self-and Directed Assembly of Nanocellulose**  
Session Chair: Agne Swerin, RISE Research Institutes of Sweden  
Room: Hall of Ideas F1  
**Session 20: Foams & Gels II**  
Session Chair: Eero Konturri, Aalto University  
Room: Hall of Ideas GJ                                                                 |
| 10:54         | Nanocellulose/Polyacrylate Acid Composites Delivered by Polyethylene Glycol  
*Caitlyn Clarkson, Purdue University*  
Optimizing the Structure and Mechanical Properties of Chiral-Nematic Cellulose Scaffolds for Tough Bioinspired Polymer Composites  
*Bharath Natarajan, National Institute of Standards and Technology*  
Ultraglare, Highly Thermal Insulating and Fire Resistant Aerogel by Encapsulating Cellulose Nanofiber with Two-dimensional MoS2  
*Hongli Zhu, Northeastern University*  
**Session 20: Foams & Gels II**  
Session Chair: Eero Konturri, Aalto University  
Room: Hall of Ideas GJ                                                                 |
| 11:16         | Embedding Cellulose Nanocrystals (CNCs) into Polymer Particles for Enhanced Processing  
*Priya Venkatraman, Virginia Tech*  
Cellulose Nanocomposites: Vacuum Infusion of Cellulose Nanofiber Preforms with Bio-Based Epoxy  
*Kristiina Oksman, University of Oulu*  
**Session 20: Foams & Gels II**  
Session Chair: Eero Konturri, Aalto University  
Room: Hall of Ideas GJ                                                                 |
| 11:38         | Improving Compatibility and Compounding of Cellulose Nanocrystals in Polymer Composites  
*Ronald Sabo, USDA Forest Service, Forest Products Laboratory*  
Cellulose Nanofibrils Aerogel: Development and Application in Water Treatment  
*Feng Jiang, The University of British Columbia*  
**Session 20: Foams & Gels II**  
Session Chair: Eero Konturri, Aalto University  
Room: Hall of Ideas GJ                                                                 |
| 12:00pm-2:00pm| **Session 21 - Lunch with Presentation Sponsored by NanoCellulose Forum**  
Present Situation and Future Prospects of Nanocellulose R&D in Japan  
Speaker: Akira Isogai, University of Tokyo  
Room: Ballroom CD                                                                 |
| 2:00pm-3:30pm | **Session 22: Photonics and Optical Applications**  
Session Chair: Joel Kelly, BC Research Inc.  
Room: Hall of Ideas EH  
**Session 23: Nanocellulose Based Composites**  
Session Chair: Xiaolin Cai, FPInnovations  
Room: Hall of Ideas F1  
**Session 24: Nanocellulose For Enhancing Paper**  
Session Chair: Nathalie Lavoine, North Carolina State University  
Room: Hall of Ideas GJ                                                                 |
| 2:02          | Circularly Polarized Light Detection on Transistors Using Cellulose Photonic Dielectrics  
*Luis Pereira, CENIMAT/3ON and CEMOP/UNINOV*  
Controlling Cellulose Nanocrystal Location within Latex Systems by Tuning Interfacial Compatibility  
*Elina Niinivaara, McMaster University*  
Surface Application of Microfibrillated Cellulose (MFC)  
*David Cowles, GL&V USA Inc.*  
**Session 22: Photonics and Optical Applications**  
Session Chair: Joel Kelly, BC Research Inc.  
Room: Hall of Ideas EH  
**Session 23: Nanocellulose Based Composites**  
Session Chair: Xiaolin Cai, FPInnovations  
Room: Hall of Ideas F1  
**Session 24: Nanocellulose For Enhancing Paper**  
Session Chair: Nathalie Lavoine, North Carolina State University  
Room: Hall of Ideas GJ                                                                 |
| 2:24          | “Patchy” Modification of CNFs with a Thermoresponsive Polymer for a “Switchable” Liquid Crystal  
*Bailey Risteen, Georgia Institute of Technology*  
Dry-Spun Neat Cellulose Nanofibril Filaments: Effect of Process Variables and Additives on Filament Properties  
*Shokoofeh Ghasemi, University of Maine*  
Enhancing Coating Holdout with Cellulosic MicroFibrils  
*Donna Johnson, University of Maine*  
**Session 22: Photonics and Optical Applications**  
Session Chair: Joel Kelly, BC Research Inc.  
Room: Hall of Ideas EH  
**Session 23: Nanocellulose Based Composites**  
Session Chair: Xiaolin Cai, FPInnovations  
Room: Hall of Ideas F1  
**Session 24: Nanocellulose For Enhancing Paper**  
Session Chair: Nathalie Lavoine, North Carolina State University  
Room: Hall of Ideas GJ                                                                 |
| 2:46          | UV-blocking Hybrid Nanocellulose Films Containing Ceria and Silica Nanoparticles  
*Tiffany Abitbol, RISE Research Institutes of Sweden*  
Understanding the Impact of Cellulose- and Chitin-Based Nanomaterials in Various Polymer Matrix Constructs  
*Cameron Irvin, Georgia Institute of Technology*  
LCA of Packaging Containing Microfibrillated Cellulose From Spruce  
*Ellen Soldal, Oustfold Research*  
**Session 22: Photonics and Optical Applications**  
Session Chair: Joel Kelly, BC Research Inc.  
Room: Hall of Ideas EH  
**Session 23: Nanocellulose Based Composites**  
Session Chair: Xiaolin Cai, FPInnovations  
Room: Hall of Ideas F1  
**Session 24: Nanocellulose For Enhancing Paper**  
Session Chair: Nathalie Lavoine, North Carolina State University  
Room: Hall of Ideas GJ                                                                 |
| 3:08          | Electrophoretic Deposition of CNC-Containing Photonic and Semi-Conductive Films  
*Wadood Hamad, FPInnovations*  
Surface Modifications of Nanocellulose for Assembly of a Stable Organogel Support for Drug Crystallization  
*Manali Banerjee, Georgia Institute of Technology*  
Industry Adopted Production of Nanocellulosic Material Optimized for Increased Strength of Packaging and Printing Paper  
*Anna Svedberg, Mofle Research*  
**Session 22: Photonics and Optical Applications**  
Session Chair: Joel Kelly, BC Research Inc.  
Room: Hall of Ideas EH  
**Session 23: Nanocellulose Based Composites**  
Session Chair: Xiaolin Cai, FPInnovations  
Room: Hall of Ideas F1  
**Session 24: Nanocellulose For Enhancing Paper**  
Session Chair: Nathalie Lavoine, North Carolina State University  
Room: Hall of Ideas GJ                                                                 |
| 3:30pm-4:00pm | **BREAK**                                                                                     |
## Technical Program

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<tr>
<th>Time</th>
<th>Wednesday, 13 June (continued)</th>
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</table>
| 4:00pm-5:30pm | **Session 25: Flexible Electronics**  
Session Chair: Wadood Hamad, FPInnovations  
Room: Hall of Ideas EH | **Session 26: Characterization Methods**  
Session Chair: Linda Johnston, National Research Council of Canada  
Room: Hall of Ideas FI | **Session 27: Processing and Properties of Nanocellulose-based Films for Packaging Application**  
Session Chair: Maria Soledad Peresin, Auburn Univ.  
Room: Hall of Ideas GJ |
| 4:02          | Cellulose Nanocrystals (CNC) Derived MorC@Sulfur-doped Carbon Aerogels for Hydrogen Evolution  
Yun Lu, Research Institute of Wood Industry Chinese Academy of Forestry | Investigating the Influence of Fibril Size on Microfibrillated Cellulose (MFC) Suspension Morphology Under Flow: A Rheological Approach  
Michel Schenker, FiberLean Technologies Ltd. | All-Cellulosic Packaging From Cellulose Nanofibrils and Fatty Acid Esters  
Heli Kangas, VTT Technical Research Centre of Finland Ltd. |
| 4:46          | Launderable Conductive Fabrics with Nanocellulose Coating  
Yunsang Kim, Mississippi State University | Comparison of Supramolecular Structures of CNCs of Different Origins  
Umesh Agarwal, USDA Forest Products Laboratory | Hybrid Nanopaper of Cellulose Nanofibrils and PET Microfibers with High Tear Resistance  
Emil Gustafsson, Université Grenoble Alpes, LGP2 |
| 5:02          | See Conference App | Rheological Characterization and Testing Standards for Nanocellulose Materials  
Jianshan Liao, Renewable Bioproducts Institute, Georgia Institute of Technology | See Conference App |
| 6:30pm-10:00pm | Conference Dinner & Awards Ceremony  
Orpheum Theater  
Bus Transportation picks from the Monona Terrace Community and Convention Center at 6:00pm. |

<table>
<thead>
<tr>
<th>Time</th>
<th>Thursday, 14 June</th>
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</thead>
</table>
| 8:30am-10:00am| **Session 28: Safety in Applications**  
Session Chair: Heli Kangas, VTT Technical Research Centre of Finland Ltd.  
Room: Hall of Ideas EH | **Session 29: Applications of Nanocellulose/Inorganic Composites**  
Session Chair: John Simonsen, Oregon State University  
Room: Hall of Ideas FI | **Session 30: Emulsions & Colloids**  
Session Chair: Carl Houtman, USDA Forest Products Laboratory  
Room: Hall of Ideas GJ |
| 8:32          | What Do We Know About the Safety of Cellulose Nanomaterials: Environmental Health and Safety Roadmap, Knowledgebase and Uncertainties  
Jo Anne Shatkin, Vireo Advisors, LLC | Aligned and Stable Metallic MoS2 on Plasma Treated Mass Transfer Channels for Hydrogen Evolution Reaction  
Hongli Zhu, Northeastern University | Medium and High Internal Phase OIL-in-WATER Pickering Emulsions Stabilized by Cellulose Filaments  
Chuanwei Miao, FPInnovations |
| 8:54          | Toxicological Evaluation of Nanocellulose in Experimental Models of Occupational Respiratory Exposure  
Jenny Roberts, NIOSH | Modification of Cellulose Nanocrystals (CNC) for Fire Retardant Applications  
TriDung (TD) Ngo, InnoTech-Alberta | Surprising Adhesive Property Modifications Using Cellulose Nanocrystals  
Marc A. Dubé, University of Ottawa |
| 9:16          | Physicochemical Characterization of Novel Cellulose Materials: Challenges and Opportunities for Environmental Health Science  
Christie Sayes, Baylor University | Processing and Performance of Clay-Nanocellulose Hybrids  
Lars Berglund, KTH Royal Inst. of Technology | Tuning Cellulose Nanocrystal Acid-Base Cooperative Organocatalysts for Upgrading Biomass-Derived Platform Molecules  
Nathan Ellebracht, Georgia Institute of Technology |
| 9:38          | An Update on the Science of Demonstrating the Safety of Cellulose Nanomaterials for Food Related Uses  
James Ede, Vireo Advisors, LLC | Retardation Effects of Cellulose Nanocrystals (CNCS) in Portland Cement Pastes  
Francisco Montes, Purdue University | See Conference App |
## Technical Program

As of 5/21/18 - Subject to change – please check the conference website for updates.

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<th>Time</th>
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| 10:00am-10:30am | **Session 31: Industrial Production II**  
Session Chair: Kim Nelson, American Process Inc.  
Room: Hall of Ideas EH  
J. Y. Zhu, USDA Forest Products Laboratory  
**Session 32: Solvent Based Processing**  
Session Chair: Douglas Fox, American University  
Room: Hall of Ideas F1  
**Session 33: Foams & Gels III**  
Session Chair: Chuangwei Miao, FPInnovations  
Room: Hall of Ideas GJ  |
| 10:30am-12:00pm | **BREAK**                                                                                                           |
Product Forms and Applications  
David Skuse, FiberLiam® Technologies Limited  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Ingunn Saur Modahl, Ostfold Research  
**Panel: Life Cycle and Product Safety**  
Fleur Rol, Univ. Grenoble Alpes, CNRS, Grenoble INP  
**Panel: Industrial Production II**  
Brian O'Connor, FPInnovations  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Kevin Dunn, NIOSH  |
| 10:54          | Scaling up the CNC Production: Optimizing Cellulose Degradation with Gaseous HCl  
Timo Pääkkönen, Aalto University  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Jeffrey Luo, Georgia Institute of Technology  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Kevin De France, McMaster University  |
| 11:16          | Phosphorylated Cellulose Nanofibers Produced by Twin Screw Extrusion: Effect of Concentration and Phosphorous Salt  
Carson Meredith, Georgia Institute of Technology  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Kevin De France, McMaster University  |
| 11:38          | Using Solid Organic Acids for Sustainable, Economic, and Tailored Production of Cellulose Nanomaterials  
J. Y. Zhu, USDA Forest Products Laboratory  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Hannes Orelma, VTT Technical Research Centre of Finland Ltd.  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Nathalie Lavoine, North Carolina University  |
| 12:00pm-2:00pm | **Session 34: Keynote Presentation and Lunch**  
Beyond Nano: Why Tiny Bits of Trees Make a Big Difference for Forests  
Keynote Speaker: Michael Goergen  
U.S. Endowment for Forestry & Communities, Inc.  
Room: Ballroom CD  |
| 2:00pm-3:30pm  | **Session 35: LCA Manufacturing, Life Cycle and Product Safety**  
Session Chair: Brian O’Connor, FPInnovations  
Room: Hall of Ideas EH  
**Session 36: Adhesive and Bonding Properties of Nanocellulose**  
Session Chair: Greg Schueneman, USDA Forest Products Laboratory  
Room: Hall of Ideas FG  
**Session 37: Films and Suspension Properties**  
Session Chair: Tiffany Abitbol, RISE Research Institutes of Sweden  
Room: Hall of Ideas GJ  
**Session 38: Student Session:**  
Career Roundtable  
Moderator: Nathan Ellbracht, Georgia Tech  
Room: MNQR  |
| 2:02           | Microfibritated Cellulose in Products: Calculation of Environmental Costs and Benefits using Life Cycle Assessment  
Ingunn Saur Modahl, Ostfold Research  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Yussef Esparza, University of Tokyo  |
| 2:24           | Microfibritated Cellulose Ecotoxicological Effects to the Final Treated Industrial Effluent of a Pulp Mill  
Braz José Demuner, Fibria Cellulose  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Jo Anne Shatkin, Vireo Advisors, LLC  |
| 2:46           | Cellulose Nanomaterials in Products - Risk Assessment According to European Commission’s Guideline  
Heli Kangas, VTT Technical Research Centre of Finland Ltd.  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Shaul Lapidot, Melodea, Ltd.  |
| 3:08           | Overview of NIOSH Field Studies for the Assessment and Control of Nanocellulose Materials  
Kevin Dunn, NIOSH  
**Session 39: Films and Suspension Properties**  
Session Chair: Tiffany Abitbol, RISE Research Institutes of Sweden  
Room: Hall of Ideas GJ  |
| 3:08           | Cellulose Nanomaterials in Products - Risk Assessment According to European Commission’s Guideline  
Heli Kangas, VTT Technical Research Centre of Finland Ltd.  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
John Simonsen, Oregon State University  |
| 3:08           | Cellulose Nanomaterials in Products - Risk Assessment According to European Commission’s Guideline  
Heli Kangas, VTT Technical Research Centre of Finland Ltd.  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
J. Y. Zhu, USDA Forest Products Laboratory  |
| 3:08           | Cellulose Nanomaterials in Products - Risk Assessment According to European Commission’s Guideline  
Heli Kangas, VTT Technical Research Centre of Finland Ltd.  
**Panel: Environmental and Tailored Production of Cellulose Using Solid Organic Acids for Sustainable,**  
**Research**  
Yussef Esparza, University of Alberta  |
**Technical Program**

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<tr>
<td>3:30pm-4:00pm</td>
<td><strong>BREAK</strong></td>
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</table>
| 4:00pm-5:30pm | **Session 39: Energy Storage Applications**  
Session Chair: J. Y. Zhu, USDA Forest Products Laboratory  
Room: Hall of Ideas EH  
**Structural and Electrochemical Performance of Cellulose Nanocrystal (CNC) Derived Carbon**  
Kyungho Kim, Purdue University  
**Application of Cellulose Nanocrystal (CNCs) Coatings on Polymers - A Pathway for Enhancement of Barrier Properties of Polymers**  
MD Nuruddin, Purdue University  
**Global Regulatory Requirements Overview of Nanomaterial Safety Testing**  
Kimberly Ong, Vireo Advisors |
| 4:02 | **Heavy Metal-Free Tannin from Bark for Sustainable Energy Storage**  
Hongli Zhu, Northeastern University  
**Development of a Chitosane-Nanocellulose Based Biosorbent for an Efficient Adsorption of Copper Ions in Aqueous Solutions**  
Ilse Cardenas, Université du Québec à Trois-Rivières  
**Metrology Challenges for Characterization of Cellulose Nanocrystals**  
Linda Johnston, National Research Council Canada |
| 4:22 | **Nanocrystalline Cellulose Based Electroactive Polymer**  
Maobing Tu, University of Cincinnati  
**Preparation of Polypropylene Nanocomposites with Amphiphilic Janus ACC-Nanocellulose Created by Aqueous Counter Collision**  
Tetsuo Kondo, Kyushu University  
**The Effect of Pretreatment on Key Properties of Cellulose Nanofibers from Hybrid Aspen as Characterized Using Response Surface Methodology**  
Simon Jonasson, Luleå University of Technology |
| 4:46 | **Robust Paper-Based Electrochromic Devices Enabled by Nanocellulose-Coated Paper and Chitin Nanofiber Barrier Layers**  
Augustus Lang, Georgia Institute of Technology  
**SEE CONFERENCE APP**  
**Cellulose Nanocrystals from Flax Shives using HCI Vapour Hydrolysis; Accessibility of the Hydroxyl Groups, Crystallite Shapes and Three-Dimensional Arrangement**  
M. Jonathan Leboucher, Normandie Univ/CNRS |
| 5:02 | **SEE CONFERENCE APP** |
| 5:22 | **Session 40: Functional Materials**  
Session Chair: Robert Moon, USDA Forest Products Laboratory  
Room: Hall of Ideas F  
**Global Regulatory Requirements Overview of Nanomaterial Safety Testing**  
Kimberly Ong, Vireo Advisors |
| 5:46 | **Global Regulatory Requirements Overview of Nanomaterial Safety Testing**  
Kimberly Ong, Vireo Advisors |
| 6:02 | **Session 41: Characterization and Quantification of Cellulose Nanomaterials**  
Session Chair: Jo Anne Shatkin, Vireo Advisors, LLC  
Room: Hall of Ideas GJ  
**Global Regulatory Requirements Overview of Nanomaterial Safety Testing**  
Kimberly Ong, Vireo Advisors |
| 6:22 | **Global Regulatory Requirements Overview of Nanomaterial Safety Testing**  
Kimberly Ong, Vireo Advisors |

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Visit the Product Showcase
Tuesday, 12 June, 2018
5:30 PM - 7:30 PM

Samples of products, materials, etc., from Academics, Researchers, and Industry will be on display to be shared with attendees. This session will be held in conjunction with exhibitor tabletops and poster session.

*Showcase Participants:
- Consultant for Addisperse
- FPInnovations
- ICL
- INNOVATECH Engineering
- Kyoto University
- Purdue University

*Check the conference app for the most current list of participating companies.

Spotlight on Students

TAPPI Nano 2018 features two activities put on by and for students.

Student Presenters
Stop by the Nano Division Student committee table to see student presenters featured at this year’s conference. A looping presentation will feature student bios, photos, and key points about their presentations.

Student Session Co-Chairs
Watch for student session co-chairs at selected sessions during the conference. Students will gain experience and knowledge by helping out in this key role.

2018 Student Session Co-Chairs

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Georgia Tech
Co-chair

Nathan Ellebracht
Georgia Tech
Co-chair

Kevin DeFranc
McMsters University
Vice chair

Fleur Rol
Grenoble INP
Secretary

Priya Venkatraman
Virginia Tech
Engagement Chair
TAPPI Nano Division Awards

This year’s awards will be presented on Wednesday, 13, June, 2018 at the awards ceremony which will be held during the conference dinner.

International Nanotechnology Division Award and FiberLean® Technologies Prize
Wadood Y. Hamad, MA, PhD, FPInnovations

Dr Hamad is an expert in nanomaterials, soft matter physics and the development of sustainable high-tech applications from bio-based materials. He obtained his PhD in Materials Science from McGill University in 1994, and has been a Principal Scientist with FPInnovations, since 2003. He is now the Science Manager of the Transformation and Interfaces Group within the BioProducts Innovation Centre of Excellence, FPInnovations. Wadood also holds an adjunct professorship at the University of British Columbia’s Department of Chemistry.

Prior to joining Paprican, now FPInnovations, Wadood was Senior, then Principal, Scientist at International Paper’s Corporate Research Center (1998-2003). He was also a tenured Lecturer in Materials Science at the University of Manchester, UK (1994-98). While at IP, Wadood was responsible for the development of key patented technologies for packaging design and performance. At FPInnovations, he is responsible for the scale-up, implementation and commercialization of cellulose nanocrystals. He holds over 22 patents in the fields of cellulose nanocrystals applications, polymer composites and packaging technology, and has published over 100 papers in journals such as Nature and Advanced Materials. Wadood has also written seven book chapters and three monographs, most recently on Cellulose Nanocrystals: Properties, Production and Applications (Wiley 2017). He is a fellow of the Royals Society of Chemistry and the Institute of Materials, Mining and Minerals (UK).

Colleen is the Director of the Process Development Center at the University of Maine where she leads the Center’s mission to provide cost-effective, rapid response research and technical services for the pulp, paper and packaging industries.

Prior to joining the University of Maine in June 2018, Colleen was Technical Director at TAPPI. While there, Colleen supported the development of the TAPPI Nano Conference for nearly ten years, the launch of the TAPPI Nano Division in 2011, and provided strategic guidance to the Division’s key committees.

Colleen authored and co-authored several articles to increase awareness of the Division’s activities as well as international research in cellulose nanomaterials.

She has over 20 years of experience in R&D, new product and business development in the paper industry, having worked for ABB, Tenneco Packaging, Westvaco, and Georgia Tech. Colleen received her bachelor’s degree in chemical engineering from the University of Delaware, and her masters and doctorate degrees from the Institute of Paper Science & Technology.
TAPPI Nano Division Awards

International Nanotechnology Division’s Mid-Career Award
Mehdi Tajvidi, University of Maine

Mehdi started his scientific career at the Forest Products Laboratory, Madison, WI in 2001 where he worked as a visiting scientist working on his dissertation on dynamic mechanical analysis of wood plastic composites. After completing his Ph.D. program in Natural Resources Engineering at the University of Tehran in 2003, Mehdi worked as an Assistant and later an Associate Professor at the Department of Wood and Paper Science and Technology, the University of Tehran for 8 years. In 2007 Mehdi received the Japan Society for the Promotion of Science (JSPS) award to do research at the Department of Biomaterials Sciences, the University of Tokyo, Japan where he worked as a Visiting Professor for two years. Upon moving to Canada in 2011, Mehdi worked as a Visiting Professor at the Department of Chemical Engineering, University of Waterloo, ON, Canada before Joining the School of Forest Resources in September 2013 as the Assistant Professor of Renewable Nanomaterials. Mehdi’s areas of research interest are production, characterization and performance evaluation of renewable nanomaterials and their composites. At UMaine, Mehdi established the Laboratory of Renewable Nanomaterials with a focus of wet applications of cellulose nanomaterials in large-volume product development. To date, Mehdi has published over 100 papers in peer-reviewed academic journals, presented over 40 presentations at international conferences and advised/co-advised over 45 graduate students. Over the past four years, the Laboratory of Renewable Nanomaterials has secured over $1.5 M of grant funding for nanocellulose related research.

International Nanotechnology Division’s Student Award
Nathan C. Ellebracht, Georgia Tech

Nathan Ellebracht is a PhD candidate finishing his fourth year in the Chemical and Biomolecular Engineering department at the Georgia Institute of Technology. He is funded by and works closely with the Renewable Bioproducts Institute (RBI) of Georgia Tech and works in the research group of Prof. Christopher Jones. He received his bachelor’s degree in Chemical Engineering from UC Berkeley before moving to Georgia Tech for his PhD. He has had the fortunate opportunity to attend four years of TAPPI Nano conferences, starting in Atlanta in 2015. Within Georgia Tech and beyond he has been strongly involved in the nanocellulose community, helping start the Cellulose Nanomaterials at Georgia Tech (CN@GT) group, being a co-founding board member and current co-chair of the TAPPI Nano Student Committee, and more.
Poster Session & Student Poster Competition

Tuesday, 12 June, 2018 • 5:30pm - 7:30pm
Ballroom A/Grand Terrace

Comparison of Grafting-From Techniques for the Synthesis of Salt Resistant and Thermoresponsive CNC-Polymer Hybrids for use as Rheology Modifiers
Paul Balding, Georgia Tech

Combination of Twin Screw Extruder and Homogenizer to Produce High Quality Nanofibrillated Cellulose with Low Energy Consumption
Gabriel Banvillet, Univ. Grenoble Alpes, CNRS, Grenoble INP, LGP2

Carbohydrate Based Fire Retardant Coatings for Wood
Ashish Bhattarai, American University

Surface Modification of Cellulose for Melt Blended PLA Composites
Dominique Brager, American University

Nanolabelling Regulation and Value Chain. Hidden Possibilities of Creating a Competitive Advantage
Ricardo Santana Cabello, Pontificial Bolivarian University

The Green Fabrication and Investigation of Lignin Effect on the Anti-degradation Property Of Lignocellulosic Nanofibrils
Yuan Chen, Chinese Academy of Forestry, Research Institute of Wood Industry

Alkaline Pre-Treatments and Different Parameters as Facilitators for Obtaining Cellulose Nanofibrils
R. A. P. Damásio, Industrial RDI

Form Cellulose Polymer Composite using CNC Exchange
Anh Do, American University

Potential use of Pineapple Agricultural Waste to develop Nano Structured Filtration Supports
Marianelly Esquivel, Universidad Nacional, Heredia,

Mechanical and Barrier Properties of Films using Thiol-ene Functionalized Cellulose Nanofibers
Kendra Fein, University of Maine

Effects of Cellulose Nanofibrils with Different Addition Methods on Furnish Drainability and Paper Properties
Ming He, Qilu University of Technology

Highly Effective Electromagnetic Interference Shielding Materials Based on Waste Cotton Fabrics/ Carbon Nanotubes via Layer-by-Layer Self-Assembly Route
Zhengguang Heng, Sichuan University

Multilateral Measurement of Cellulose Nanofibers
Satoshi Hirata, National Institute of Advanced Industrial Science and Technology

Separation and Structural Changes in Hemicellulose from Pretreated Wheat Straw by Steam Explosion
Langeng Hui, Tianjin University of Science and Technology

Increasing the Consistency of Refiner-produced Cellulose Microfibrils in a Plate & and Frame Press
Donna Johnson, University of Maine

Development of Safety Assessment Methods for Cellulose Nanofibers
Hideo Kajihara, National Institute of Advanced Industrial Science and Technology

Preparation of Cellulose Nanocrystalline/ Acrylonitrile-Butadiene- Styrene Nanocomposites
Noy Kaufman, American University

Currency Paper Manufacturing Experience with Addition of Cellulose Nanofibrils
Shaul Lapidot, Melodea Ltd.

Cellulose Nano Crystals (CNC), Bio-building Blocks for Tomorrow’s Materials
Hak Lae Lee, Seoul National University

Energy-saving Approach for Production of Cellulose Nanofibrils: Carboxymethylation of Pulp
Zhu Long, Jiangnan University

Study on Properties of Microcrystalline Cellulose Reinforced Hydroxypropyl Starch-based Composite Films
Taeyoung Kim, KOMSCO

Post-sulfonation of Cellulose Nanofibrils With a One-Step Reaction to Improve Dispersibility
Jeffrey Luo, Georgia Institute of Technology
Poster Session & Student Poster Competition

Development of CNF with High Transparency and Viscosity
Ikko Matsusue, Daio Paper Corporation

Improvement of CFRP Fatigue Strength by adding CNF
Kouta Ogura, Sugino Machine Ltd.

Characterisation Of Cellulose-reinforced Polymer Composites
Caterina Palange, Bristol Composites Institute, University of Bristol

Paper Based Electrolytes as Gate Dielectric in Oxide Thin Film Transistors
Luis Pereira, CENIMAT/I3N and CEMOP/UNINOVA

Preparing of a Composite Nano Disperse Dye using a Hydroxypropyl Sulfonated Lignin Dispersant and the Interaction of Dispersant and Dye Surface
Yanlin Qin, School of Chemical Engineering and Light Industry, Guangdong University and Technology

Role of Native Cellulose Nanofibrils in Foam Dynamics
Orlando Rojas, Aalto University

Agroi - Industrial Waste Valorisation into Advanced Microfibrillated Cellulose Fibers for improving Packaging Materials Performance
Pilar Albaladejo Sánchez, ITENE

Hybrid Coatings based on Nanocellulose/Silver Nanowires to develop Barrier and Antimicrobial Properties for Active Packaging Applications
Hugo Spieser, University Grenoble Alpes

Water-soluble Cellulose Acetate from Waste Cotton Fabrics and the Aqueous Processing of All-Cellulose Composites
Xunwen Sun, Sichuan University

Bacterial Cellulose 3D Structuring towards new Applications
Blaise Tardy, Aalto University

Recipe to Synthesize Aerogels with Tunable Properties: From Design Principles to Application
Anurodh Tripathi, North Carolina State University

High-power Supercapacitor Fabricated with active Electrode Material Derived from Reduced Graphene Oxide/Cellulose Composites
Ruibin Wang, Guangdong University of Technology
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GOLD

CelluForce is the world leader in the commercial production of CelluForce NCCTM, a form of Cellulose NanoCrystals (CNC) produced from trees. CelluForce NCCTM is a sustainable and high performance material that can be used in a variety of products to improve their properties. www.celluforce.com

FiberLean® Technologies is a composite material comprised of mineral and wood pulp which has been processed together to create a micro-fibrillar mineral network. Mineral content can vary depending on the final application. Potential benefits of MFC/ mineral networks include fiber network reinforcement, fluid viscosification and enhancement of the end-product’s functional performance. www.fiberlean.com

The Georgia Tech Renewable Bioproducts Institute (RBI) is the premier research institute for transformation of biomass into valued products, including pulp and paper, renewable energy, chemicals and advanced materials. We are an innovation ecosystem bringing together education, research, government and industry to enable companies to seize new opportunities and develop future leaders. www.rbi.gatech.edu

Membrane Specialist LLC offers innovative, customized process solutions for a wide variety of filtration and separation applications using microfiltration, ultrafiltration, nanofiltration and reverse osmosis technologies. With experience developed over three decades, our capabilities range from bench top feasibility studies to piloting to plant design, build and installation and technical support.

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Membrane Specialist LLC offers innovative, customized process solutions for a wide variety of filtration and separation applications using microfiltration, ultrafiltration, nanofiltration and reverse osmosis technologies. With experience developed over three decades, our capabilities range from bench top feasibility studies to piloting to plant design, build and installation and technical support.

Nanocellulose Forum (NCF) was established in 2014 to accelerate R&D, industrialization and standardization of nanocellulose. More than 200 companies join NCF such as manufacturers, suppliers, consumers, machinery companies and analytical service companies of nanocellulose. NCF conducts many activities for technology transfer, sample transfer and discovery of new business opportunities.

Surface Measurement Systems engineers innovative experimental techniques and instrumentation for physico-chemical characterization of complex solids. We are the world leaders in Dynamic Vapor Sorption technology and Inverse Gas Chromatography instrumentation and solutions. Our range of instruments has helped solve difficult characterization issues and are used by hundreds of leading laboratories.

Sugino develops, designs, and manufacturers wet pulverizing/dispersing equipment, “Star Burst”, by our ultra-high-pressure water jet technologies. It brings an innovative process to make super fine particles such as graphene, carbon Nano tube, etc. Sugino also produces cellulose nanofiber, “BiNFi-s”, by this equipment with only water, no chemical modification.
World leader in the production of Cellulose NanoCrystals

We harness the power of nature to create better products

CelluForce NCC™ properties
The core CelluForce NCC™ properties allow its use in diverse applications leading to new or improved products

**Strong**
High crystallinity imparts strength and hardness to composite structures

**Surface Active**
Functional groups allow modifications to improve interactions with solvents and polymers

**Suspending**
Liquid crystal structure allows stable suspension of particles

**Thixotropic**
Crystal aspect ratio creates unique viscosity and shear thickening properties

**Emulsive**
Charge on crystal allows the formation of Pickering emulsions to stabilize colloidal suspensions

**Temperature resistant**
High purity allows stable properties up to the decomposition temperature of cellulose

**Sustainable**
Nanocrystals, formed by nature, are extracted from an abundant and renewable resource

**Safe**
Cellulose in nano-form has been extensively tested and shown to be benign

[Website: celluforce.com]
TAPPI Board of Directors

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<td>Fabio Perini North America</td>
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International Nanotechnology Division Council

International Nanotechnology Division Leadership

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<td>Emily Cranston</td>
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<td>USDA Forest Service</td>
<td>McMaster University</td>
<td>Stora Enso</td>
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Hamdy Khali
WoodBridge Foam Corporation

Nathalie Lavoine
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VTT Technical Research Centre of Finland

Functional Materials & Soft Matter Subcommittee
Yaman Boluk, Chair
University of Alberta

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FPInnovations

Isabelle Captron, Secretary
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Warren Batchelor, Vice Chair
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Christina Schuetz, Chair
KU Leuven

Webinar Committee
Johan Foster, Chair
Virginia Tech

TAPPI thanks these committee volunteers for their service. Committee Membership is open to any TAPPI member. Stop by the registration desk if you would like to join one of these committees.
TAPPI Sustaining Corporate Members (as of April 23, 2018)

<table>
<thead>
<tr>
<th>Company Name</th>
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<tr>
<td>A. H. Lundberg Associates Inc.</td>
<td>Fosber America Inc.</td>
<td>Probiotic Solutions</td>
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<td>A.G. Stacker Inc.</td>
<td>George M. Martin Company</td>
<td>Procemex Oy Ltd</td>
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<td>Air Conveying Corporation</td>
<td>GPA</td>
<td>Pulsar America Inc.</td>
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<td>AkzoNobel Pulp and Performance Chemicals</td>
<td>Grain Processing Corporation</td>
<td>RE S.p.A. Controlli Industriali</td>
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<td>Alliance Machine System Int’l.</td>
<td>The Haire Group</td>
<td>Runtech Systems</td>
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<td>Andritz</td>
<td>Hansol Paper</td>
<td>Samuel Strapping Systems</td>
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<td>AstenJohnson</td>
<td>Ingredion Incorporated</td>
<td>SAPP Management AG</td>
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<td>Automatan Inc.</td>
<td>International Paper</td>
<td>Sappi North America</td>
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<td>Automated Conveyor Systems</td>
<td>INX International Ink Company</td>
<td>Sauer System</td>
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<td>BASF Corporation</td>
<td>Jacobs</td>
<td>SCG Packaging Public Company Limited</td>
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<td>Baysek Machines Inc.</td>
<td>Kadant Inc.</td>
<td>Scion (New Zealand Forest Research Institute Ltd.)</td>
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<td>BHS Corrugated North America Inc.</td>
<td>Kamin LLC</td>
<td>Siemens Industry Inc.</td>
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<td>Bobst North America Inc.</td>
<td>Kao Corporation</td>
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<td>SKF USA Inc.</td>
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<td>Kemira</td>
<td>SNF SAS</td>
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<td>Kiwiplan</td>
<td>Solenis</td>
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<td>Cargill Inc.</td>
<td>Layne Christensen Company</td>
<td>Systec Conveyors</td>
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<td>CEL Chemical &amp; Supplies</td>
<td>Leo Paper Bags Manufacturing Limited</td>
<td>TABER Industries</td>
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<td>Celulosa Y Energia Punta Pereira S.A</td>
<td>LyondellBasell</td>
<td>Tamil Nadu Newsprint &amp; Papers Ltd.</td>
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<td>Coldwater Group Inc.</td>
<td>Maxcess (Webex, Fife, Tidland, MAGPOWR)</td>
<td>Tate &amp; Lyle</td>
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<td>Copar Corporation</td>
<td>Mica Corporation</td>
<td>TEADIT</td>
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<td>Miller Mechanical Services Inc.</td>
<td>Techlab Systems S.L.</td>
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<td>Mitsubishi Heavy Industries America</td>
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<td>Testing Machines Inc.</td>
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<td>Crane &amp; Company Inc.</td>
<td>MTR Martco</td>
<td>Thacker Industrial Service Company</td>
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<td>Cristini</td>
<td>Muhlen Sohn Inc.</td>
<td>Thiele Kaolin Company</td>
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<td>Dixie Chemical Company Inc.</td>
<td>Nalco Water an Ecolab Co</td>
<td>Thwing-Albert Instrument Company</td>
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<td>DuPont Industrial Biosciences</td>
<td>New Generation Packaging</td>
<td>Trinseo LLC</td>
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<td>EMBA Machinery AB</td>
<td>OASIS Alignment Services Inc.</td>
<td>TSP - Technology Service Professionals</td>
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<td>OJJI Holdings Corporation Library</td>
<td>Unified Purchasing Group</td>
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<td>ESKO</td>
<td>OMYA Inc.</td>
<td>Valmet Inc.</td>
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<td>Esco Inc.</td>
<td>OpTest Equipment Inc.</td>
<td>Visy Industries Centre</td>
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<td>Everlight USA, Inc.</td>
<td>Pacific Southwest Container</td>
<td>Voith Paper Fabric &amp; Roll Systems Inc.</td>
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<td>Packaging Corp. of America</td>
<td>WestRock</td>
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<td>Panther Systems Inc.</td>
<td>Zenith Cutter</td>
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Nano 2018 Bookstore

These special publications from TAPPI are available to attendees of the 2018 TAPPI International Conference on Nanotechnology. Stop by TAPPI Central to purchase your copy. Purchase your copy on-site and SAVE on shipping.

NEW! Nanocellulose Producers, Products, and Applications: A Guide for End Users
PRINT: Order Code: 0101R350
ELECTRONIC: Order Code: 0101R350EL
Member Price: $249 • Non-member Price: $325

Cellulose Nanocrystals: Properties, Production and Applications
Order Code: 17CELLNANO
Member Price: $135 • Non-member Price: $162

Nanotechnology Health and Environmental Risks, Second Edition
Order Code: 13NANOENV
Member Price: $45 • Non-member Price: $55

Production and Application of Nanocellulose Materials
Order Code: 0101R332
Member Price: $172 • Non-member Price: $199

Advances in Lignocellulosic Characterization
Order Code: 0101R280
Member Price: $118 • Non-member Price: $177

Nano Science and Nano Materials: Synthesis, Manufacturing and Industry Impacts
Order Code: 12NSNM
Member Price: $129 • Non-member Price: $149

Nanocellulose: From Nature to High Performance Tailored Materials
Order Code: 13NANOCCELL
Member Price: $180 • Non-member Price: $196

Nanotechnology: Understanding Small Systems
Order Code: 11NANOSMALL
Member Price: $80 • Non-member Price: $100

Polymer Nanocomposite Handbook
Order Code: 11POLYNANO
Member Price: $116 • Non-member Price: $145

Nanotechnology for the Forest Product Industry Vision and Technology Road Map
Order Code: 0101R314
Member Price: $62 • Non-member Price: $73

Introduction to Nanocomposite Materials
Order Code: 16INTNANO
Member Price: $89 • Non-member Price: $99

Order Code: 0202SMOOK4
Member Price: $95 • Non-member Price: $123
General Information

ADA Assistance
Attendees with special needs are encouraged to contact the staff at the TAPPI Registration Desk so TAPPI can make your participation more enjoyable and meaningful.

Antitrust Policy Statement
TAPPI is a professional and scientific association organized to further the application of science, engineering, and technology in the pulp and paper, packaging and converting, and allied industries. Its aim is to promote research and education, and to arrange for the collection, dissemination and interchange of technical concepts and information in fields of interest to its members. TAPPI is not intended to, and may not, play any role in the competitive decisions of its members or their employers, or in any way restrict competition among companies.

Commercialism Policy
Although commerce is a driving force for our technologies, TAPPI technical sessions are not a platform for commercial (sales) presentations. Presentations that are technical and objective enhance the credibility of the presenter and his or her organization. Restricting commercialism ultimately benefits both the presenters and the TAPPI audience. Excessive use of brand names, product names or logos, failure to substantiate performance claims, and failure to objectively discuss alternative methods, processes or equipment are indicators of sales presentations.

Badges
It is important that the official badge supplied at the time of registration be worn at all times. This practice is a courtesy to your fellow registrants. It also indicates that you have completed registration and may participate in the events scheduled. Admission to technical sessions and workshops will be by badge only.

Hosted Events not sponsored by TAPPI
All company hosted events (customer meetings, social events, etc.) that are not officially a part of TAPPI’s program may not conduct group functions which compete with scheduled TAPPI activities, such as technical sessions, committee meetings, receptions, award ceremonies, group meals and trade fairs or exhibits. If you are planning to host a group event, please check with the TAPPI Account Manager to avoid conflict.

TAPPI’s Policy Regarding Equipment at Non-Exhibit Events
TAPPI prohibits the unauthorized physical display or demonstration of equipment in sessions, workshops, or committee meetings held during TAPPI seminars, short courses, conferences, or other meetings unless approved by the TAPPI Account Manager. This prohibition does not preclude the graphic non-commercial depiction of equipment via slides, pictures, or video tape. This prohibition is intended to preclude commercialism and to minimize attendee exposure to potentially dangerous equipment and to avoid conflicts with contractual and governmental requirements regarding the use of meeting facilities. All inquiries should be directed through the TAPPI Account Manager on-site.

Lost and Found
Articles which are found should be brought to the Registration Area. Please note the room in which the article was found for the purpose of tracing it to the appropriate owner.

Membership and Publication Information
TAPPI membership dues, membership applications (TAPPI and committee), and requests for TAPPI publications may be obtained at the registration.

Nonmembers of TAPPI
If you apply for membership in TAPPI while at this meeting, you will be able to register at the member rate. Take advantage of this opportunity to join TAPPI and save money.

Photographic Consent
Photographs may be taken during this meeting for TAPPI to use for publicity purposes. A registrant’s presence at the meeting constitutes consent for TAPPI to use the photographs in which he or she may appear.

Ribbons
Association, technical division, and committee officers are requested to pick up their ribbons at the registration desk. Session chairmen and speaker ribbons will also be available at the registration desk.

Tax Deduction for Educational Expenses
U. S. Treasury regulation paragraph 1.162.5 permits an income tax deduction for educational expenses (registration fees and cost of travel, meals, and lodging) undertaken to: (1) maintain or improve skills required in one’s employment or other trade or business, or (2) meet express requirements of an employer or a law imposed as condition to retention of employment, job status, or rate of compensation. Under the Tax Reform Act of 1993, however, non-reimbursed employment-related educational expenses are deductible only to the extent that they exceed 2% of adjusted gross income. In addition, the new tax law limits the deduction for otherwise allowable business meals and business entertainment to 50% of cost.

Use of Personal Video Recording Equipment at Technical Sessions
The use of personal recording equipment to record technical sessions at TAPPI conferences is strictly prohibited. Only TAPPI’s official designee is authorized to video tape sessions. Should a company and/or individual seek to violate this prohibition, that company and individual will be barred from giving technical presentations at TAPPI sponsored events for a period of two years, that period starting from the date of infraction. TAPPI staff is authorized to have equipment in violation of this policy immediately removed upon detection and shipped to the owner’s principle location at the owner’s expense. Inquiries on this policy should be directed to the TAPPI Meetings Department, c/o TAPPI headquarters.

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Safety Information

Fire Survival
When you reach your hotel room, ask yourself: Can I close my eyes, hold my breath, and go directly to the nearest fire exit WITHOUT LOOKING in 15 seconds?

You may have to do just that:
• Under emergency conditions
• In smoke
• In darkness
• At 3:00 a.m.

Because panic is the main problem in unfamiliar surroundings, you should prepare for emergencies when you travel. The following information is provided to help you prepare for a hotel fire emergency. Remember that by-products of fire (gases, smoke, etc.) kill more people than fire itself.

Survival Plans
• Familiarize yourself with your new surroundings by checking the emergency exit and escape routes.
• Ensure that doors are unlocked and exit routes are free of obstructions.
• Study the room you are staying in (do the windows open, what is the distance to the ground, etc.).
• Avoid elevators in emergency situations.
• Count the number of doors and walls between your room and the emergency exits. Smoke could obscure lighted signs.

Before and After Leaving the Room
• When an alarm sounds, slowly feel the surrounding walls and doors with the back of your hand. If the door is warm, stay as low as possible (to avoid smoke) and open it slowly. If the door and walls are not warm, proceed toward the emergency exit using the most direct route. If the smoke is too heavy, remain in room.
• Take the key with you. You might find it safer to return to your room.
• If the smoke thickens as you go down the escape stairs, go up one flight and cross over to an alternate staircase.
• If access to the alternate staircase is blocked, proceed to your room and wait for assistance.
• Avoid breaking windows. Broken windows can allow fire and smoke into the room. If a window must be broken or opened, dangle a bed sheet from the window as a signal to firemen. Don’t jump if the fall is more than two stories.

If You Cannot Leave the Room
• Place towels and bedclothes around the door areas. Keep them soaked with water.
• Fill the bathtub and use it as a reservoir for wetting down the entire room. Placing yourself in a filled tub will not offer protection.
• Hold a wet towel around your face to filter smoke.
• Dial the hotel emergency number (0) to tell rescue personnel where you are.

General Safety Tips
To make your conference experience a safe and enjoyable one, please keep the following safety tips in mind. While you are out of the hotel, please know that, like in all cities, awareness and caution are certain to help ensure your safety. A common crime is pick pocketing, with women’s purses being the prime target. Some simple precautions you can take are:

• Never carry all of your valuables in the same place. Keep them secured in a safe deposit box.
• Never walk alone at night, especially to off property locations; there really is safety in numbers!
• Do not leave purses, briefcases or other personal property unattended in public locations. Use hotel services such as a coat check or luggage storage.
• Remove your name badge while out of the hotel. They identify you as an out-of-towner and easy target for crime.
• Women: carry your purse with the strap over your shoulder and across your chest, keeping it closed or latched with the bag portion in front of you. For added protection in crowds, you can rest your hand on top. Be particularly watchful of distractions in revolving doors, elevators or in the public.
• Men: Wrap a heavy rubber band around your wallet to prevent it from being easily slipped out of your pocket or carry it in your front pants pocket.
• If you find that you have become a victim, report the crime to the police.
• Report any suspicious persons or behavior in the hotel or convention center to the registration desk or any TAPPI staff.
NANOCELLULOSE: PRODUCERS, PRODUCTS, AND APPLICATIONS

A GUIDE FOR END USERS
AUTHOR: JACK MILLER

Featuring profiles of more than 50 producers with product specifications, process descriptions and guides for obtaining samples.

HIGHLIGHTS INCLUDE:
- STATUS OF COMMERCIAL DEVELOPMENT
- OVERVIEW OF ISSUES RELATING TO ENVIRONMENT, HEALTH, AND SAFETY
- CELLULOSE NANOMATERIAL POTENTIAL BY APPLICATION

GET YOUR COPY OF THIS HIGHLY ANTICIPATED GUIDE AT TAPPI.ORG/NANOUSERGUIDE

AVAILABLE IN PRINT AND ELECTRONIC FORMAT.
TAPPI’s International Nanotechnology Division

Join one of the Division’s committees

Research Committee
- A forum for researchers to exchange information and collaborate on projects
- Eight subcommittees cover applications, functionalization and characterization
- Members review and select abstracts for the annual conference

Producers Committee
- Open to producers of cellulose nanomaterials only, and conducted under TAPPI’s strict antitrust policy
- A forum where producers can identify industry-wide and pre-competitive issues

Student Committee
- A forum for students to engage in technical discussions, seek advice, and meet students around the world
- A resource for tools and advice for career development

Webinar Committee
- Develops webinar series on a variety of topics

Join our global community of professionals and students!
- Network with other scientists
- Plan the annual conference
- Launch initiatives to support the Division mission

Stop by TAPPI Registration and sign up to join TAPPI, the Division or a Committee, or visit www.tappinano.org to join.
Nanocellulose Forum
An AIST consortium

To accelerate of R&D, industrialization and standardization of cellulose nanofibrils and cellulose nanocrystals, Nanocellulose Forum (NCF) was established on June 2014 in National Institute of Advanced Industrial Science and Industry (AIST). More than 200 companies join NCF such as manufacturers, suppliers, consumers, machinery companies and analytical service companies of nanocellulose. Researchers in universities and public institute, a central government and local governments also became our members. NCF conducts a lot of activities for technology transfer, sample transfer and discovery of new business opportunities.

Nanocellulose Exhibition 2018

Date  2018.12.6 to 8
Venue  Tokyo Big Sight International Exhibition Hall (Tokyo Bay Area)
Contact for exhibition  Nikkei PR Advertising Co.,Ltd. email: ecopro-intl@nikkeipr.co.jp
Contact for visiting  Nanocellulose Forum, email: ncf-ml@aist.go.jp

TAPPI Nano 2019

Date  2019.6.3 to 7
Venue  Makuhari Messe, International Conference Hall (Within 30 min from Tokyo Stn.)
Nanocellulose Forum will support TAPPI Nano 2019 held in Japan. See you next year.